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EXAMINER

QUASH, ANTHONY G

ART UNIT

PAPER NUMBER

2881

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/507,423

Applicant(s)

MELVIN A. PARK

Examiner

Anthony Quash

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Claim Objections

Claim 6 is objected to because it is unclear from the applicant's amendment whether or not the applicant wanted to cancel 6 or amend claim 6. In the amendment, paper number 9, the applicant has both cancelled and amended claim 6. Correction as to the clarity of applicant's intention to claim 6 is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6,8,16-17,20,23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bertsch [275] in view of Ikebe [JP 488]. As per claim 1, Bertsch [275] teaches an apparatus for transporting ion from an ionization source region (14) to a first pressure region (16) within a mass spectrometer, wherein the apparatus comprises first and second capillary sections (55,59) each having an inlet end and an outlet end, and a union (60) having first and second openings. See Bertsch [275] abstract, figs. 1-2, 5, col. 1 lines 5-20, col. 4 lines 4-22, col. 5 lines 30-67, and col. 6 lines 1-7. However, Bertsch [275] does not specifically state that the union is

configured to removably interface the first and second capillary sections. Ikebe [JP 488] does teach a union (3,7,13) being configured to removably interface the first and second capillary sections (2c, 6). See Ikebe [JP 488] abstract and figs. 1-5. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the union configured to removably interface the first and second capillary sections in order to prevent the vacuum lowering of the mass spectrometer during the exchange of capillary column as taught in Ikebe [JP 488]. In addition Bertsch [275] suggest that the union (60) comprise a sealing mechanism for sealing the connection between the ionization source region and the first pressure region of the mass spectrometer. This is made evident when Bertsch [275] states, "The endpiece may be attached to the capillary tube by any convenient means of attachment, including for example application of an adhesive such as an epoxy at the junction between the endpiece and the capillary. See Bertsch [275] col. 5 lines 65-67 and col. 6 lines 1-5.

As per claim 3, Ikebe [JP 488] teaches the union (7,10) means for removably securing the ends of the first and second sections (2c, 6). See Ikebe [JP 488] abstract and figs. 1-5. Also see Bertsch [275] abstract, figs. 1-2, 5, col. 1 lines 5-20, col. 4 lines 4-22, col. 5 lines 30-67, and col. 6 lines 1-7.

As per claim 4, Ikebe [JP 488] teaches means for providing an airtight seal between the ends of the first and second sections within the union. See Ikebe [JP 488] abstract and figs. 1-5. Also see Bertsch [275] abstract, figs. 1-2, 5, col. 1 lines 5-20, col. 4 lines 4-22, col. 5 lines 30-67, and col. 6 lines 1-7.

As per claim 5, Bertsch [275] teaches the inlet ends and outlet ends comprising conductive end caps. Also see Bertsch [275] figs. 1-2, 5, col. 4 lines 4-22, and col. 5 lines 30-67.

As per claim 6, Bertsch [275] teaches the apparatus maintaining pressure conditions in the first pressure region of the mass spectrometer. See Bertsch [275] abstract, figs. 1-2, 5, col. 1 lines 5-20, col. 4 lines 4-22, col. 5 lines 30-67, and col. 6 lines 1-7. Also see Ikebe [JP 488] abstract and figs. 1-5.

As per claim 8, Bertsch [275] teaches the ionization source being an ESI device. See Bertsch [275] abstract, figs. 1-2, 5, col. 1 lines 5-20, col. 4 lines 4-22, col. 5 lines 30-67, and col. 6 lines 1-7.

As per claims 16,25, Bertsch [275] teaches a system and method for performing mass spectrometric analysis, wherein the system and method comprise generating ions in an ion source region (14) delivering the ions from the ion source region (14) to a first pressure region (16) of the at least one mass spectrometer, via a multiple part capillary device (55,59) for providing an interface between the ion source region (14) and the mass spectrometer while maintaining pressure conditions of the first pressure region of the mass spectrometer, and performing at least one mass analysis on the ions in the at least one mass spectrometer. See Bertsch [275] abstract, figs. 1-2, 5, col. 1 lines 5-20, col. 4 lines 4-22, col. 5 lines 30-67, and col. 6 lines 1-7. However, Bertsch [275] does not specifically state that interface is removable. Ikebe [JP 488] does teach the interface being removable. See Ikebe [JP 488] abstract and figs. 1-5. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention

was made to have the interface be removable in order to prevent the vacuum lowering of the mass spectrometer during the exchange of capillary column as taught in Ikebe [JP 488].

As per claim 17, Bertsch [275] teaches a multiple part capillary device comprising a first capillary section (55) including an inlet orifice for accepting ions from the ion source, a union (60) for connecting to at least the first capillary section (55), a second capillary section (59) connected to the union (60). See Bertsch [275] abstract, figs. 1-2, 5, col. 1 lines 5-20, col. 4 lines 4-22, col. 5 lines 30-67, and col. 6 lines 1-7. However, Bertsch [275] does not specifically state the interface between the ion source and the mass spectrometer being removable. Ikebe [JP 488] does teach the interface between the ion source and the mass spectrometer being removable. See Ikebe [JP 488] abstract and figs. 1-5. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the interface between the ion source and the mass spectrometer be removable in order to prevent the vacuum lowering of the mass spectrometer during the exchange of capillary column as taught in Ikebe [JP 488]. In addition, Bertsch [275] suggest that the union (60) comprise a sealing mechanism for sealing the connection between the ionization source region and the mass spectrometer. This is made evident when Bertsch [275] states, "The endpiece may be attached to the capillary tube by any convenient means of attachment, including for example application of an adhesive such as an epoxy at the junction between the endpiece and the capillary. See Bertsch [275] col. 5 lines 65-67 and col. 6 lines 1-5.

As per claim 20, Bertsch [275] teaches at least one of the first and second capillary sections being metallic. See Bertsch [275] col. 5 lines 40-65.

As per claims 23,26, Bertsch [275] teaches at least one ion source (14) being selected from the group consisting of an electrospray ion source, an atmospheric pressure ionization source, a matrix-assisted laser desorption/ionization ion source, a pneumatic assisted electrospray source, an electron impact source, a chemical ionization source, a plasma desorption source and a liquid chromatography source. See Bertsch [275] col. 4 lines 5-22.

As per claims 24,27, Bertsch [275] teaches the mass spectrometer (16) being selected from the group consisting of a quadrupole mass spectrometer, a time-of-flight mass spectrometer, an ion trap mass spectrometer, an ion cyclotron resonance mass spectrometer, and a magnetic sector mass spectrometer. See Bertsch [275] col. 4 lines 5-22.

Claims 7, and 9-11,13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bertsch [275] in view of Ikebe [JP 488] and further in view of Mordehai [892]. As per claim 7, Bertsch [275] teaches that the capillaries may be used as an interface between other ion sources. See Bertsch [275] col. 4 lines 5-20. However, Bertsch [275] nor Ikebe [JP 488] specifically state the ion source being an API source. Mordehai [892] does teach that it is known to use an API ion source using capillaries. See Mordehai [892] figs. 1, 11 and abstract. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an API source with the capillary interface in Bertsch [275] since it was known to use API

sources with capillaries to transport ions into a mass spectrometer. In addition, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the ion source be an API source, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claim 9, Mordehai [892] teaches the ionization source being a pneumatic assisted electrospray source. See Mordehai [892] col. 13 lines 15-30

As per claim 10, Mordehai [892] teaches the ionization source being an electron impact source. See Mordehai [892] col. 1 lines 10-50.

As per claim 11, Mordehai [892] teaches the ionization source being a chemical ionization source. See Mordehai [892] col. 1 lines 10-50.

As per claim 13, Bertsch [275] teaches that the device can be used with other ion sources such as a plasma desorption source. See Bertsch [275] col. 4 lines 5-21.

As per claim 14, Mordehai [892] teaches the ionization source being a liquid chromatography source. See Mordehai [892] col. 1 lines 10-50.

Claims 19,21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bertsch [275] in view of Ikebe [JP 488] and further in view of Sharp [963]. However, Bertsch [275] in view of Ikebe [JP 488] does not specifically state that at least one of the first and second capillary sections being insulating. Sharp [963] does teach at least one of the first and second capillary sections being insulating. See Sharp [963] fig. 2, 6-8, col. 2 lines 64-69, col. 6 lines 20-45, col. 8 lines 10-60, col. 55 lines 55-69, col. 11 lines 1-35, col. 13 lines 1-25, col. 14 lines 5-20, and col. 24 lines 1-40. It would have

been obvious to one having ordinary skill in the art at the time the invention was made to have at least one of the first and second capillary sections being insulating, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

As per claim 21, Sharp [963] teaches at least one of the first and second capillary sections comprises a flexible tube. See Sharp [963] col. 5 lines 20-35.

Claims 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bertsch [275] in view of Ikebe [JP 488] and further in view of Sharp [963] in view of Yost [439]. Bertsch [275] in view of Ikebe [JP 488] and further in view of Sharp [963] teach all aspects of the claim except for heating the capillary tube. Yost [439] does teach heating the capillary tube. See Yost [439] abstract, col. 1 lines 15-25, col. 3 lines 5-25, and col. 4 lines 35-45. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to heat the capillary in order to reduce the time interval between resolution of successive samples as taught in Yost [439].

Claims 1,2,12,16-18,22, rejected under 35 U.S.C. 103(a) as being unpatentable over Sproch [327] in view of Henion [671]. As per claim 1,16-17, Sproch [327] teaches an apparatus for transporting ions from an ionization source region to a first pressure region within a mass spectrometer, a capillary (54) a union (53) having first and second openings, wherein the union comprises a sealing mechanism for sealing the connection between the ionization source region and the first pressure region of the mass spectrometer. See Sproch [327] abstract, figs. 1-2, columns 6-7, col. 9 lines 55-67, and

col. 10 lines 1-20, 50-60. However, Sproch [327] does not specifically state that the capillary being composed of first and second sections. Henion [671] does teach the capillary being composed of first and second sections (12,16). See Henion [671] abstract, figs. 2-4, col. 1 lines 5-30, col. 2 lines 25-60, and columns 3-4. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the capillary be composed of first and second sections connected by a union in order to allow quick replacement of damaged or clogged capillaries. In addition, Henion [671] teaches a sealing mechanism for the removable interface between the ion source and mass spectrometer. See Henion [671] col. 4 lines 35-45.

As per claims 2,18, Sproch [327] teaches the channel having a helical structure. See Sproch [327] fig. 2.

As per claim 12, Henion [671] teaches that it is known to use matrix assisted laser desorption ionization sources as ion sources. See Henion [671] col. 1 lines 5-30.

As per claim 22, Sproch [327] teaches heating the capillary. See Sproch [327] col. 6 lines 30-50 and col. 7 lines 20-30.

Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sproch [327] in view of Henion [671] and further in view of Karger [112]. Sproch [327] in view of Henion [671], teach all aspects of the claim, except for the apparatus being used to multiplex samples. However, Karger [112] does teach an apparatus for multiplexing samples. See Karger [112] abstract, col. 3 lines 1-10, col.18 lines 35-45. Therefore, it would have been obvious to a person of ordinary skill in the art at the time

the invention was made to multiplex samples in order to perform simultaneously analysis several samples as taught in Karger [112]

Response to Arguments

Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 4994,165 to Lee et al, is considered pertinent because of its discussion on liquid junction coupling for capillary zone electrophoresis/ion spray spectrometry.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

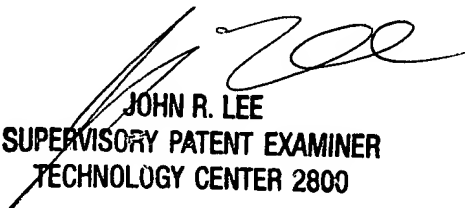
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (703)-308-6555. The examiner can normally be reached on M-F from 9 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee, can be reached on (703)-308-4116. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.



A. Quash 1/23/03



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